

We Claim:

1. A heat sealing and cutting mechanism to form a heat seal and a cut across a tube of flexible packaging material, said heat sealing and cutting mechanism comprising:

a carrier ²⁰⁸ to contact said tube;

a pair of closely spaced heat sealing bands ²²² on said carrier, said heat sealing bands being energizable to form closely spaced heat seals across said tube when said carrier is in contact with said tube and said heat sealing bands are energized, said heat sealing bands being configured to define temperature gradients therealong; and

a cutting element ²⁴⁰ on said carrier and disposed between said heat sealing bands, said cutting element being energizable to cut said tube when said carrier is in contact with said tube.

2. A heat sealing and cutting mechanism according to claim 1 wherein said heat sealing bands are vulcanized onto an electrically insulating backing ²¹² that is affixed to said carrier.

3. A heat sealing and cutting mechanism according to claim 2 wherein each heat sealing band has indentations ²²⁶ formed in at least one side thereof at spaced locations to define a set of fins ²²⁸.

4. A heat sealing and cutting mechanism according to claim 3 wherein each heat sealing band has indentations formed in opposite sides thereof to define two sets of fins, the indentations formed in each side being generally aligned so as to generally align the fins of each set.

5. A heat sealing and cutting mechanism according to claim 2 wherein said cutting element is vulcanized into said backing.

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6. A heat sealing and cutting mechanism according to claim 5 wherein an undersurface of said cutting element is serrated²⁴⁴ to define a set of spaced teeth, said teeth being embedded in said backing so that said cutting element presents a cutting edge in front of said backing.

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7. A heat sealing and cutting mechanism according to claim 6 wherein said heat sealing bands and said cutting element are curved.

8. A heat sealing and cutting mechanism according to claim 5 wherein the ends of said heat sealing bands are joined at tabs, said tabs extending beyond the ends of said backing and being connectable to a power supply.

9. A heat sealing and cutting mechanism according to claim 8 wherein tabs are formed at the ends of said cutting element, said tabs extending through said backing and said carrier and being connectable to a power supply.

10. A heat sealing and cutting mechanism according to claim 9 wherein said carrier is formed of anodized aluminum and said backing is formed of silicon rubber.

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11. A heat sealing and cutting mechanism according to claim 1 wherein said heat sealing bands are convex.

12. A heat sealing and cutting station for a container forming apparatus to form heat seals and cuts across a fluid filled tube of flexible packaging material at longitudinally spaced locations, said heat sealing and cutting station comprising:
a heat sealing and cutting mechanism including:
a carrier to contact said tube;
a pair of closely spaced heat sealing bands on said carrier, said heat sealing bands being energizable to form closely spaced heat seals across said tube when said carrier is in contact with said tube and said heat sealing bands are

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energized, said heat sealing bands being configured to define temperature gradients therealong when energized; and

a cutting wire on said carrier and disposed between said heat sealing bands, said cutting wire being energizable to cut said tube when said carrier is in contact with said tube;

a support on which said carrier is mounted on one side of said tube, said support being movable between a retracted position where said carrier is spaced from said tube and an extended position where said carrier is in contact with said tube;

a backing plate on an opposite side of said tube, said backing plate being aligned with said carrier and being movable between a retracted position spaced from said tube and an extended position in contact with said tube; and

a drive operable on said support and said backing plate to move said carrier and backing plate between the retracted positions where said tube is free and said extended positions where said tube is trapped between said carrier and backing plate.

13. A heat sealing and cutting station according to claim 12 wherein said heat sealing bands are vulcanized onto an electrically insulating backing that is affixed to said carrier and wherein said cutting wire is vulcanized in said backing, said cutting wire being centrally disposed between said heat sealing bands.

14. A heat sealing and cutting station according to claim 13 wherein each heat sealing band has indentations formed in at least one side thereof at spaced locations to define a set of fins.

15. A heat sealing and cutting station according to claim 14 wherein each heat sealing band has indentations formed in opposite sides thereof to define two sets of fins, the indentations formed in each side being generally aligned so as to generally align the fins of each set.

16. A heat sealing and cutting station according to claim 12 wherein said backing plate has an electrically insulating backing thereon, said backing being convex in shape and having a groove formed therein, said groove being aligned with said cutting wire.

17. A heat sealing and cutting station according to claim 16 wherein an undersurface of said cutting wire is serrated to define a set of spaced teeth, said teeth being embedded in said backing so that said cutting wire presents a cutting edge in front of said backing.

18. A heat sealing and cutting station according to claim 17 wherein said carrier is formed of anodized aluminum and wherein said backings are formed of silicon rubber.

19. A heat sealing and cutting station for a container forming apparatus to form heat seals and cuts across a tube of flexible packaging material at longitudinally spaced locations, said heat sealing and cutting station comprising:

at least one set of jaws moveable between an open position where said tube is free and a closed position where said tube is trapped between said jaws;

a heat sealing and cutting mechanism carried by one of said jaws, said heat sealing and cutting mechanism including:

a pair of curved, closely spaced heat sealing bands mounted onto an electrically insulating backing, said heat sealing bands being energizable to form closely spaced heat seals across said tube when said one jaw is in contact with said tube and said heat sealing bands are energized, said heat sealing bands being configured to define temperature gradients therealong when energized; and

a cutting element on said one jaw and disposed between said heat sealing bands, said cutting element being energizable to cut said tube when said carrier is in contact with said tube; and

at least one power supply to energize said heat sealing bands and said cutting wire.

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20. A heat sealing and cutting station according to claim 19 wherein each heat sealing band has indentations formed in at least one side thereof at spaced locations to define a set of fins.

5 21. A heat sealing and cutting station according to claim 20 wherein each heat sealing band has indentations formed in opposite sides thereof to define two sets of fins, the indentations formed in each side being generally aligned so as to generally align the fins of each set.

10 22. A heat sealing and cutting mechanism according to claim 21 wherein said heat sealing bands are convex.

23. A heat sealing and cutting mechanism according to claim 22 wherein said other jaw carries an insulating convex backing.

15 24. A heat sealing and cutting mechanism according to claim 23 wherein said backing has a groove formed therein that is aligned with said cutting element.

20 25. A heat sealing and cutting station according to claim 23 wherein each heat sealing band has indentations formed in at least one side thereof at spaced locations to define a set of fins.

25 26. A heat sealing and cutting station according to claim 24 wherein each heat sealing band has indentations formed in opposite sides thereof to define two sets of fins, the indentations formed in each side being generally aligned so as to generally align the fins of each set.

27. A heat sealing blade formed of electrically conductive material comprising:
30 an elongate body having opposite sides; and
a set of spaced fins extending from at least one side of said body.

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28. A heat sealing blade according to claim 27 wherein a set of spaced fins extend from each side of said body.

5 29. A heat sealing blade according to claim 28 wherein said fins are generally rectangular.

30. A heat sealing blade according to claim 29 wherein said body is curved.

10 31. A heat sealing blade according to claim 29 wherein said body is straight.

15 32. A heat sealing blade according to claim 31 further including a rise extending along said body between said sides.

33. A heat sealing blade according to claim 28 wherein said body is convex.

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